

Notice of Allowability

Application No.

09/730,408

Examiner

Melvin Marcelo

Applicant(s)

CASLEY ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to after-final amendment filed Feb 18, 2005.
2. ☒ The allowed claim(s) is/are 1-28.
3. ☒ The drawings filed on 25 June 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mark Ascolese, Reg. 42268, on March 11, 2005.

The application has been amended as follows:

2. (Currently Amended) The method of Claim 1, wherein said selective enqueueing further comprises:

determining an input queue status of said ~~input~~ inbound queue; and
combining said input queue status with said backpressure signal to determine
said selectively enqueueing.

8. (Currently Amended) The method of Claim 1, wherein for a plurality of switch elements:

each said enqueueing in a switch element queue comprises determining a local
QSP and combining said local QSP with a prior QSP communicated from
a prior switch element to form a new QSP;
each said dequeuing to a next said switch element further comprises
communicating said new QSP to said next switch element.

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10. (Currently Amended) The method of Claim 8, wherein ~~said last~~ the switch element queue comprises a plurality of queue elements and said determining a local QSP is based on a number of said queue elements in use in said queue.

11. (Currently Amended) The method of Claim 8, wherein ~~said last~~ the switch element queue comprises a plurality of queue elements and said determining a local QSP is based on a fill rate of said plurality of queue elements.

12. (Currently Amended) An apparatus for controlling queue congestion in a multi-stage switch, said multi-stage switch comprising at least one ingress linecard, a plurality of switch elements arranged from a first switch element to a last switch element, and at least one egress linecard, comprising:

an ingress linecard comprising circuitry to selectively enqueue a data packet in
an inbound queue;

said first switch element, into which said ingress linecard dequeues said data packet, comprising circuitry to enqueue said data packet in a first switch element queue;

said last switch element, into which an upstream switch element dequeues said data packet, comprising circuitry to enqueue said data packet in ~~said a~~ a last switch element queue and determine a last queue status parameter (QSP); and

an egress linecard, into which said last switch element dequeues said data

packet and communicates said last QSP, comprising:
circuitry to enqueue said data packet in an output queue, said output queue having an output queue status;
circuitry to combine said output queue status with said last QSP to periodically form a backpressure signal; and
circuitry to communicate said backpressure signal to said ingress linecard, wherein said circuitry to selectively enqueue said data packet in said ingress linecard is influenced at least in part by said backpressure signal.

15. (Currently Amended) The apparatus of Claim 12, wherein ~~each~~ said last switch element queue comprises a plurality of queue elements and said QSP is based on a number of said queue elements in use in said queue.

16. (Currently Amended) The apparatus of Claim 12, wherein ~~each~~ said last switch element queue comprises a plurality of queue elements and said QSP is based on a fill rate of said plurality of queue elements.

20. (Currently Amended) The apparatus of Claim 12, having a plurality of switch elements, each of said plurality of switch elements comprising:

circuitry to enqueue said data packet in a corresponding switch element queue;
circuitry to determine a local QSP;

circuitry to combine said local QSP with a prior QSP communicated from a prior switch element to form a new QSP; and
circuitry to communicate said new QSP to ~~said~~ a next switch element.

22. (Currently Amended) The apparatus of Claim 20, wherein ~~each said~~ the switch element queue comprises a plurality of queue elements and said local QSP is determined based on a number of said queue elements in use in said queue.

23. (Currently Amended) The apparatus of Claim 20, wherein ~~said each said~~ the switch element queue comprises a plurality of queue elements and said local QSP is determined based on a fill rate of said plurality of queue elements.

25. (Currently Amended) An apparatus for controlling queue congestion in a multi-stage switch, said multi-stage switch comprising at least one ingress linecard, a plurality of switch elements arranged from a first switch element to a last switch element, and at least one egress linecard, comprising:

an ingress linecard comprising means for selectively enqueueing a data packet in
an inbound queue;

said first switch element, into which said ingress linecard dequeues said data packet, comprising means for enqueueing said data packet in a first switch element queue;

said last switch element, into which an upstream switch element dequeues said

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data packet, comprising means for enqueueing said data packet in said a last switch element queue and determine a last queue status parameter (QSP); and

an egress linecard, into which said last switch element dequeues said data packet and communicates said last QSP, comprising:

means for enqueueing said data packet in an output queue, said output queue having an output queue status;

means for combining said output queue status with said last QSP to periodically form a backpressure signal; and

means for communicating said backpressure signal to said ingress linecard, wherein said circuitry to selectively enqueue said data packet in said ingress linecard is influenced at least in part by said backpressure signal.

26. (Currently Amended) A computer system for queue congestion control in a multi-stage switch, said multi-stage switch comprising at least one ingress linecard, a plurality of switch elements arranged from a first switch element to a last switch element, and at least one egress linecard; said computer system comprising computer instructions for:

selectively enqueueing a data packet in an inbound queue in said ingress linecard;

dequeuing said data packet to said first switch element;

enqueueing said data packet in a first switch element queue in said first switch element;

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dequeuing said data packet to said last switch element;
enqueueing said data packet in a last switch element queue in said last switch element, wherein said enqueueing comprises determining a last queue status parameter (QSP);
dequeuing said data packet to said egress linecard, said dequeuing further comprising communicating said last QSP to said egress linecard;
enqueueing said data packet in an output queue, said output queue having an output queue status;
wherein said ~~method~~ instructions periodically ~~combines~~ combine said output queue status with said last QSP, forming a backpressure signal.

27. (Currently Amended) A computer-readable storage medium, comprising computer instructions for queue congestion control in a multi-stage switch, said multi-stage switch comprising at least one ingress linecard, a plurality of switch elements arranged from a first switch element to a last switch element, and at least one egress linecard; said computer instructions comprising:

selectively enqueueing a data packet in an inbound queue in said ingress linecard;
dequeuing said data packet to said first switch element;
enqueueing said data packet in a first switch element queue in said first switch element;
dequeuing said data packet to said last switch element;
enqueueing said data packet in a last switch element queue in said last switch

element, wherein said enqueueing comprises determining a last queue status parameter (QSP);

dequeuing said data packet to said egress linecard, said dequeuing further comprising communicating said last QSP to said egress linecard;

enqueueing said data packet in an output queue, said output queue having an output queue status;

wherein said ~~method~~ instructions periodically ~~combines~~ combine said output queue status with said last QSP, forming a backpressure signal.

28. (Currently Amended) A computer data signal embodied in a carrier wave, comprising computer instructions for queue congestion control in a multi-stage switch, said multi-stage switch comprising at least one ingress linecard, a plurality of switch elements arranged from a first switch element to a last switch element, and at least one egress linecard; said computer instructions comprising:

selectively enqueueing a data packet in an inbound queue in said ingress linecard;

dequeuing said data packet to said first switch element;

enqueueing said data packet in a first switch element queue in said first switch element;

dequeuing said data packet to said last switch element;

enqueueing said data packet in a last switch element queue in said last switch element, wherein said enqueueing comprises determining a last queue status parameter (QSP);

dequeuing said data packet to said egress linecard, said dequeuing further comprising communicating said last QSP to said egress linecard; enqueueing said data packet in an output queue, said output queue having an output queue status; wherein said ~~method~~ instructions periodically ~~combines~~ combine said output queue status with said last QSP, forming a backpressure signal.

Conclusion

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Marcelo whose telephone number is 571-272-3125. The examiner can normally be reached on Mon-Fri 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571-272-3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Primary Examiner
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March 11, 2005